

REMARKS

This responds to the Office Action mailed on July 1, 2005.

Claims 1, 6, 10, 14, 16, 21, 24, and 26 are amended, claims 5, 9, 12-13, 15, 23, and 25 are canceled, and no claims are added; as a result, claims 1-4, 6-8, 10-11, 14, 16-22, 24, and 26-27 are now pending in this application.

Claim Objections

Claims 5, and 12-14 were objected to as indirect limitation and lacking antecedent basis for the term "processor" of the phrase "the semiconductor processor chip." Claim 10 was objected to as "the heat conducting layer" lacking antecedent basis.

Claims 5, 12 and 13 have been cancelled, making the objections moot. Claim 14 has been amended to correct the antecedent basis as suggested by the Examiner.

§102 Rejection of the Claims

Claims 1-14, 16-24, and 26-27 were rejected under 35 USC § 102(e) as being anticipated by Dahl et al. (U.S. 2002/0130407). Applicant does not admit that Dahl is indeed prior art and reserves the right to swear behind this reference at a later date. Nevertheless the Applicant believes that the pending claims are distinguishable from the reference for at least the following reasons.

The rejection states that Dahl teaches forming a heat conducting layer (620 in Figs 6B-6C). Dahl appears to show a heat transfer film 620 that may include diamondoid containing materials. The configuration in Dahl appears drawn to lead frame package configurations as discussed in Dahl in paragraph 0119. However, Applicant is unable to find in Dahl, a teaching of providing a flip-chip configuration semiconductor chip and integrally forming a substantially planar heat conducting layer on a backside surface of the semiconductor chip. Applicant is further unable to find in Dahl transmitting heat through a substantially continuous interface between the heat conducting layer and an external heat sink.

In contrast, claim 1 as amended includes providing a flip-chip configuration semiconductor chip and integrally forming a substantially planar heat conducting layer on a

backside surface of the semiconductor chip. Claim 1 further includes transmitting heat through a substantially continuous interface between the heat conducting layer and an external heat sink. One advantage of a configuration as described in claim 1 includes spreading heat and transmitting through a large contact interface between a heat conducting layer and an external heat sink. Using a flip chip configuration, a large heat sink can be used to further enhance heat dissipation. Support for these amendments can be found in the specification in general, and particularly on page 8, lines 28-31 and page 9, lines 1-3. Independent claims 6, 10, 16, 21, and 26 also include limitations such as flip-chip configuration, and a heat conducting layer on a backside of the chip.

Because the Dahl patent does not show every element of Applicant's independent claims, a 35 USC § 102(e) rejection is not supported. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 1-14, 16-24, and 26-27.

Claims 1-25 were rejected under 35 USC § 102(b) as being anticipated by Linn et al. (U.S. 5,569,620). Applicant respectfully traverses the rejection for at least the following reasons. The rejection states that Linn teaches forming a substantially planar heat transfer conducting layer 613/615. Linn appears to show a diamond film 613 located in a middle portion of a silicon-on-insulator (SOI) structure. However, Applicant is unable to find in Linn a teaching of forming a substantially planar heat conducting layer on a backside surface of a semiconductor chip.

In contrast, claim 1 as amended includes providing a flip-chip configuration semiconductor chip and integrally forming a substantially planar heat conducting layer on a backside surface of the semiconductor chip. Claim 1 further includes transmitting heat through a substantially continuous interface between the heat conducting layer and an external heat sink. Independent claims 6, 10, 16, 21, and 26 also include limitations such as a heat conducting layer on a backside of the chip.

Because the Linn patent does not show every element of Applicant's independent claims, a 35 USC § 102(e) rejection is not supported. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 1-25.

§103 Rejection of the Claims

Claims 26-27 were rejected under 35 USC § 103(a) as being unpatentable over Linn et al. (U.S. 5,569,620) as applied to claims 1-25 above, taken with Bertin et al. (6,255,899). Applicant respectfully submits that the additional reference of Bertin fails to provide the elements not provided by Linn and Dahl to cure the rejection based on Linn for at least the reasons outlined above.

Because the cited patents, either alone or in combination, do not show every element of Applicant's independent claims, a 35 USC § 103(a) rejection is not supported by the references. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 26-27.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney ((612) 373-6944) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 1st day of November, 2005.

Name Amy Moriarty

Signature 